
ANDREW L. BALL, MB BS ■ SUJATA RANA, MPH

KARL L. DEHNE, MD MPH

HIV Prevention among Injecting Drug Users: Responses in Developing and Transitional Countries

Dr. Ball is a Medical Officer with the Programme on Substance Abuse, Division of Mental Health and Prevention of Substance Abuse, World Health Organization, Geneva, Switzerland. Ms. Rana is a Substance Use and HIV/AIDS Advisor with the Programme on Substance Abuse, Division of Mental Health and Prevention of Substance Abuse, World Health Organization, Geneva, Switzerland. Dr. Dehne is a Research Fellow, Department of Tropical Hygiene and Public Health, University of Heidelberg, Germany.

SYNOPSIS

Objectives. Human immunodeficiency virus (HIV) infection associated with injecting drug use has been reported in at least 98 countries and territories worldwide. There is evidence that new epidemics are emerging in different regions, including Eastern Europe, Latin America, and the eastern Mediterranean. The authors provide a global overview of the situation of HIV infection associated with injecting drug use and responses that have been implemented in various developing and transitional countries.

Methods. Although there has been extensive documentation of the extent and nature of HIV infection associated with injecting drug use in many developed countries and the various interventions implemented in those countries, there is very limited information on the situation in developing and transitional countries. This chapter brings together information from a broad range of sources, including published literature; "grey" or "fugitive" literature; data collected by the World Health Organization (WHO), the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the United Nations International Drug Control Programme (UNDCP); personal communications; and direct observation by the authors. The authors have traveled extensively to a wide range of developing and transitional countries and have accessed information not readily available to the international research community.

Address correspondence to:

Dr. Ball, Programme on Substance Abuse, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland; tel. 41-22-791-4792; fax 41-22-791-4851; e-mail <balla@who.ch>.

For more than a decade it has been recognized that injecting drug use can play a critical role in determining the unfolding of the HIV epidemic in various regions, particularly in Asia, southern Europe, and the United States. For example, in Asia injecting drug use is the major mode of HIV transmission, representing over 80% of HIV cases in Kazakhstan, 75% in Malaysia, 75% in Vietnam, and 50% in China.⁴ Injecting drug use also is the major mode of HIV transmission in North Africa, Eastern Europe, the Newly Independent States, and the Middle East and is becoming more important in West Africa and Latin America.⁵ However, there is evidence from different countries and regions, in both the developed and developing world, that HIV epidemics associated with injecting drug use can be prevented, slowed, stopped, and even reversed.⁶⁻⁹ Despite this knowledge and experience, new and explosive epidemics among injecting drug users are still being witnessed; recently, the most dramatic examples have been from certain countries in Eastern Europe and the Newly Independent States, including Ukraine (Odessa and Kiev), the Russian Federation (Kaliningrad), Kazakhstan (Temirtau), and Belarus (Svetlogorsk).

In Ukraine, for example, until 1995 approximately 50 HIV infections were reported annually, after which there was a rapid increase among IDUs in several southern cities. Within a few months approximately 1500 new cases had been reported.¹⁰ By the end of 1996, the number of HIV infections reported had increased to 12,228, at least half of them among IDUs (many HIV-infected individuals were not classified by transmission category). The number of HIV-positive cases newly registered in 1997 increased to 15,443, including 7950 IDUs and 2440 prisoners; injecting drug use is the most likely mode of transmission for the majority of these cases (Y. Kobyscha, personal communication, 1998).

One year later, in 1996, similar rapid increases were reported from Belarus, Moldova, and the Russian Federation (see Figures 2 and 3). In one month, May 1996, more than 750 new HIV-infected drug users were detected among a population of 72,000 in the small Belorussian city of Svetlogorsk. Of HIV infections reported in Belarus, 87% of cases have occurred among IDUs. Figure 4 shows the rise of HIV prevalence in various cities; the Newly Independent States have followed a pattern similar to what occurred in certain European, American, and Asian cities eight to 15 years before.

The well-documented and -tested HIV prevention strategies in the developed world are now being adapted and adopted in other regions, including developing

countries (such as those in Asia and Latin America) and countries in transition (such as those in Eastern Europe and the Newly Independent States). Such interventions include opioid substitution pharmacotherapy, needle-syringe exchange and distribution, condom and bleach distribution, outreach to IDUs, peer education programs, and social network interventions. In some communities, completely new models of intervention and service delivery have developed in response to specific local needs and limitations. Although the empirical data may currently be lacking from developing countries to demonstrate their successes (or failures), these programs demonstrate that innovative HIV prevention initiatives are being implemented and sustained in a wide range of sociocultural settings.

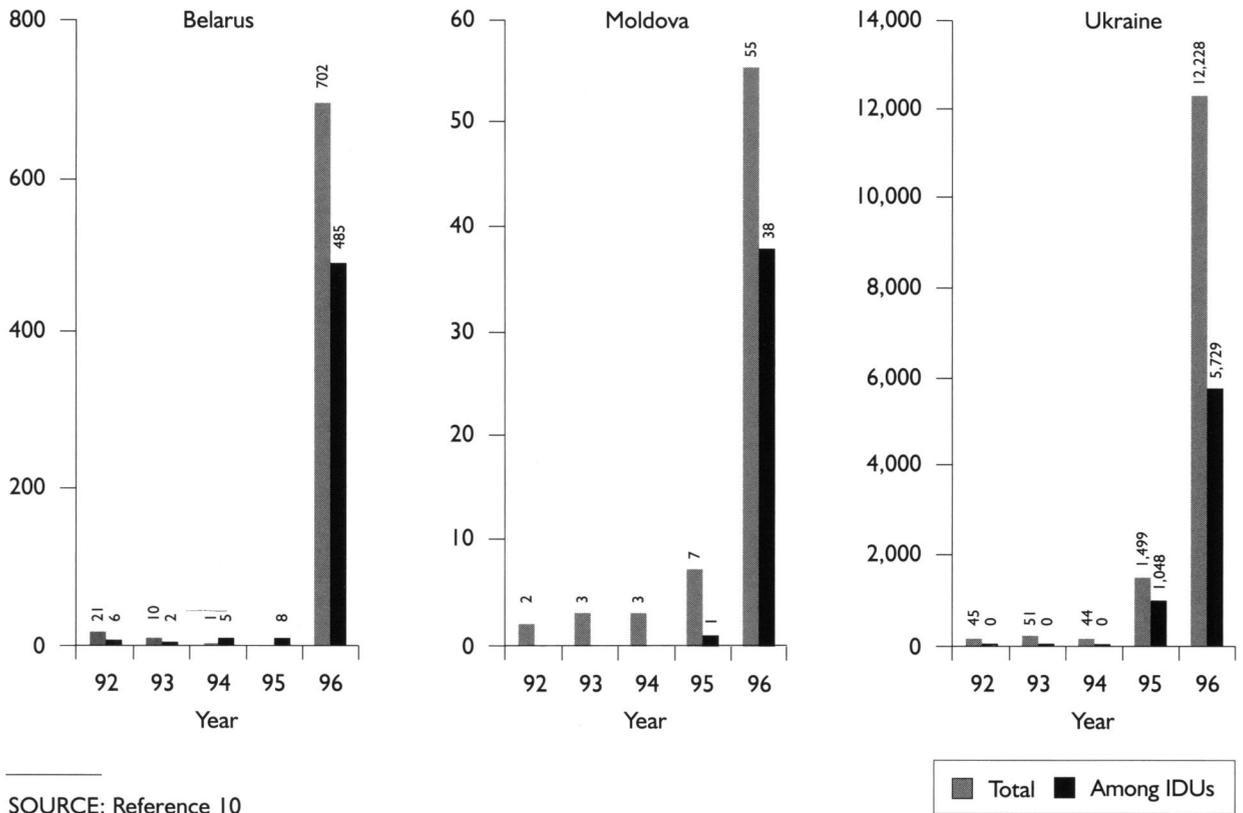
The design of effective HIV prevention strategies and the development of appropriate policies and programs for specific settings rely on the integration of three distinct elements. First, situation assessment is essential to gain a thorough understanding of the local situation with regard to injecting drug use and HIV infection and to identify potential intervention points. Second, effective interventions need to be identified, developed, and promoted for reducing HIV risk through individual and group behavior change. Third, such interventions need to be located within a public health context in which supportive environments will facilitate and sustain behavior change. This chapter focuses on the first two elements—situation assessment and strategies targeting individual behavior change—with a particular focus on developing countries. The third element—a public health response—warrants a separate and more detailed discussion beyond the scope of this chapter. This chapter is based largely on a book chapter that provides a more comprehensive discussion of these three elements.¹¹

Situation Assessment

The acquired immunodeficiency syndrome (AIDS) pandemic has provided the impetus for a reorientation of research programs targeting injecting drug use, with the promotion of qualitative research to complement more traditional survey methods.¹²⁻¹⁴ Action research, which provides information quickly on HIV risk behaviors and the context of substance use, is now taking priority. Such research aims to inform the development of appropriate interventions, policies, and programs and to facilitate a rapid and strategic response.

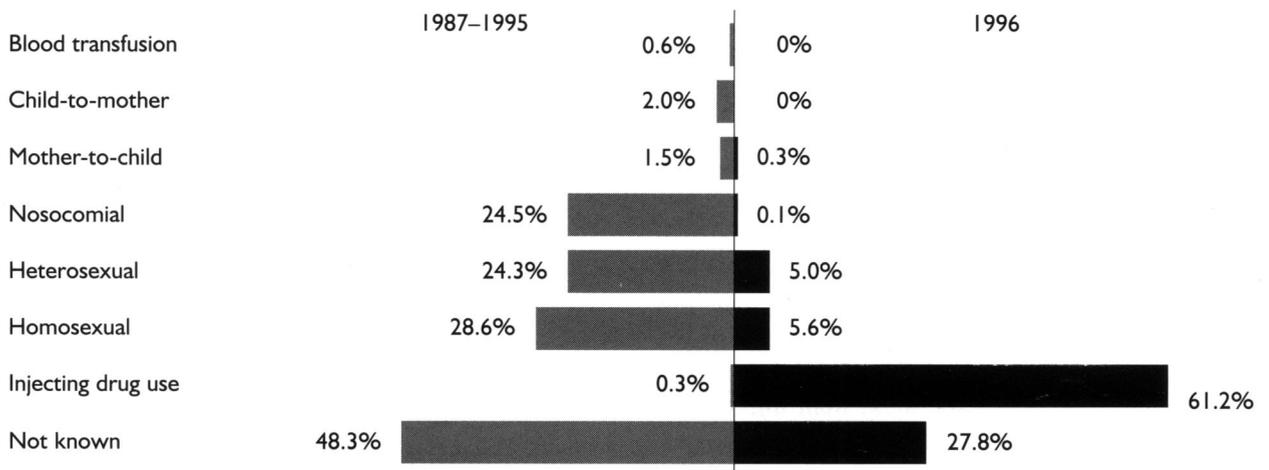
The transition from noninjecting to injecting drug use significantly increases HIV and other health risks for

Figure 2. New HIV cases (reported by year)



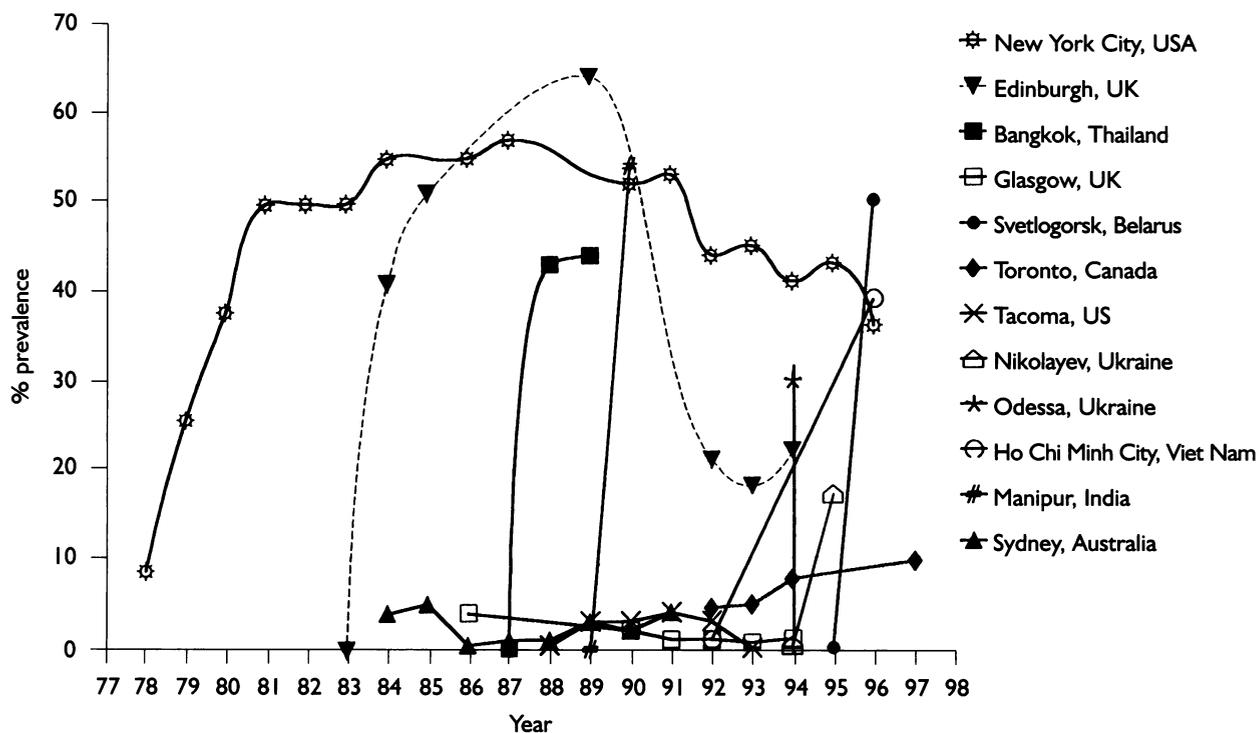
SOURCE: Reference 10

Figure 3. HIV infections by modes of transmission in the Russian Federation



SOURCE: Pokrovski V, Russia AIDS Center. Report to UNAIDS, 1998 Mar.

Figure 4. Trends in HIV prevalence among IDUs in selected cities



NOTE: The data presented here illustrate the variation in trends in HIV prevalence among certain populations of IDUs in selected cities and as such cannot be directly compared due to differences in sampling methodologies.
 SOURCE: Data compiled from multiple sources

the user, particularly if the user shares needles, syringes, and drug preparations. For each community, different site-specific factors that influence such transitions likely exist. For example, in India a reduction in the availability of heroin and the prescription of injectable buprenorphine to heroin users for the treatment of heroin withdrawal contributed to the transition from heroin smoking and chasing to buprenorphine injecting among users.¹⁵⁻¹⁸ Increasing attention is being given to research aimed at identifying factors that may influence such transitions.^{19,20} Just as the transition from noninjecting to injecting drug use increases health risks, a shift from injecting to noninjecting drug use may provide valuable information for the design of interventions.

The utilization of rapid assessment methods has played a critical role in analyzing the situation of HIV infection among IDUs in a wide range of countries where

basic data have, until recently, been nonexistent or inadequate for the planning of interventions and policies. For the most part, these assessments have been undertaken by external experts utilizing various nonstandardized qualitative methods, and they have not been published in the international literature. Despite this, many of the findings have proved essential for designing effective interventions and have provided data that otherwise would not have been collected through traditional survey methods. For example, observational and key informant methods have revealed information on syringe-mediated drug sharing and the role of ethnic minorities in heroin distribution in the former Yugoslav Republic of Macedonia.²¹ In Vietnam, cognitive mapping, peer-administered semistructured questionnaires, and ethnographic and participant observation methods have provided information on shooting galleries and the practices of professional injectors.²² Analysis of existing data and key informant and observational methods were used to assess injecting practices

and structural obstacles to the implementation of HIV prevention strategies in Myanmar.²³ In Nepal, key informant interviews and participant observation methods have been important in monitoring changes in drug use patterns. In several Eastern European cities, including Svetlogorsk in Belarus and Odessa in Ukraine, drug preparation and use behaviors have been videotaped to assist in the analysis of risk practices. Other rapid situation assessments have been undertaken in such diverse countries as Lebanon,²⁴ Cameroon,²⁵ the Czech Republic,²⁶ Belarus, Kazakhstan, Uzbekistan, and Kyrgyzstan.

To formalize and standardize drug-injecting situation analysis through rapid assessment methods, the World Health Organization (WHO) Programme on Substance Abuse (WHO/PSA) has developed a "Guide on Rapid Assessment and Response Methods for Drug Injecting" (IDU-RAR). To date this instrument has been piloted in Colombia, Nigeria, Kazakhstan, and Ukraine, and its implementation is proposed in at least 14 countries in 1998. It is being implemented in parallel with a survey instrument that collects quantitative data on a range of issues, including transitions from noninjecting to injecting drug use, young and new injectors, and consideration of other health consequences of drug injecting in addition to HIV infection. The IDU-RAR instrument incorporates principles of community involvement and development so that data may be used to inform the development of specific HIV prevention interventions for rapid implementation by the community. The instrument promotes an approach in which various assessment methods and data sources are combined, utilizing inductive approaches and data triangulation. WHO/PSA also is developing other complementary rapid assessment guides, including guides to assess substance use, health consequences, and interventions (Sub-RAR); sexual behavior associated with substance use (Sex-RAR); and substance use among especially vulnerable young people (EVYP-RAR).

Strategies Targeting Behavior Change

HIV prevention strategies aim to change behavior so that HIV risks are reduced, with the ultimate goal of eliminating risks. A wide range of strategies may be used to target specific behaviors; the effectiveness of many of these strategies has already been demonstrated. This chapter does not attempt to present this evidence. Rather, it provides an overview of what is happening in various developing and transitional countries where limited data are available and where many strategies, although promising, have not been thoroughly evaluated.

Provision of information on HIV transmission. The indiscriminate and frequent receptive sharing of injecting equipment and drug solutions by IDUs poses high risks for HIV-1, when HIV infection is present in the drug-injecting network. Minimal interventions that rely on providing basic information to IDUs on HIV transmission can significantly influence risk behaviors. Given such information, many IDUs who share equipment adopt various strategies to reduce HIV risks: reducing indiscriminate sharing, sharing only with selected partners, not sharing when blood is in the syringe, and assessing the HIV status of potential sharing partners.²⁷

The risk of HIV transmission may be significantly reduced by limiting sharing partners and mixing of drug-injecting networks.⁷ However, opportunities for restricting sharing partners are often very limited in many countries. Paraphernalia, drug possession, aiding and abetting laws, and threats of police harassment often result in IDUs congregating in "safe" drug-using venues where mixing of different networks of drug injectors occurs and sharing practices are common. For example, within shooting galleries (known as "lo chich") in Ho Chi Minh City and Hanoi, professional injector-dealers (known as the "chu") control all aspects of the injecting process, including provision of the injecting equipment, drawing up of the opioid solution from a common pot, and administering the injections.²² The person being injected usually cannot negotiate with the injector-dealer about how the equipment is cleaned or shared with other clients. In such situations, interventions should target not only the drug user but also the injector-dealer, utilizing such strategies as peer outreach and drug user advocacy groups.

Cleaning injecting equipment. The availability and affordability of sterile needles and syringes is severely limited in many communities around the world, particularly in developing countries. The promotion of strategies for cleaning equipment in such settings plays a critical role. Bleach distribution programs are most widely implemented in countries in which needle and syringe distribution programs are severely restricted.²⁸ Information on cleaning techniques and bleach distribution also are major interventions in many prison systems.²⁹⁻³¹ In Ukraine, a proposal is being considered to establish the first prison HIV prevention program in Eastern Europe that provides information on syringe cleaning techniques and bleach distribution. Programs providing advice on syringe cleaning techniques and condom and bleach distribution are being implemented in Manipur, northeastern India,^{31,32} other areas of India, Malaysia,

Vietnam, Thailand, and Nepal.³³ Other outreach programs to IDUs provide HIV prevention information in Belarus, Ukraine, Kazakhstan, the Russian Federation, China, Myanmar, Brazil, and Argentina.

IDUs in developing countries usually do not have the time or opportunity to effectively implement recommended bleaching or other sterilization procedures. Boiling is likely to damage or reduce the useful life of already inadequate equipment. Bleach is often not available in many communities and is viewed with suspicion by IDUs, often because of its smell. In Nepal, IDUs complain that bleach residue makes the needle "slippery," making it difficult to localize a vein when attempting to insert the needle for injection. Whereas bleach programs have not been demonstrated to be effective in preventing hepatitis B and C transmission, they can provide a link between health care workers and IDUs that may facilitate other HIV prevention efforts.

Provision of sterile injecting equipment. Sharing of needles and syringes may be reduced if IDUs have ready and affordable access to sterile supplies. There is strong evidence that increasing the availability of injecting equipment, through such approaches as needle and syringe exchange programs (NSEPs) and pharmacy outlets, reduces sharing and the risk of HIV infection.^{34,35}

Apart from their establishment in a range of developed countries, NSEPs also have been established in a number of developing and transitional countries, with programs initiated in Brazil (Santos and Salvador), India, Vietnam,³⁶ Nepal,³⁷ the Philippines, and even among remote Akha hill-tribe communities in northern Thailand.³⁸ NSEPs have been established in countries in Eastern Europe and the Newly Independent States, such as Belarus, Bulgaria, the Czech Republic, Slovakia, Hungary, Kazakhstan, Lithuania, Poland, the Russian Federation, and Ukraine. An NSEP was implemented in a Vietnamese refugee camp in Hong Kong in 1996 in response to the high prevalence of heroin injection in the camp, although such programs have not been established for drug injectors in the wider community.

Reducing drug-sharing practices. Ethnographic studies from various countries have demonstrated certain drug preparation and injecting practices that increase HIV risk, including sharing of injecting paraphernalia and drug preparations. For example, "frontloading" practices have been reported from a wide range of cities in developing, transitional, and developed countries. Such practices are significant as independent predictors of HIV transmission

even after controlling for syringe sharing. Other sharing practices also present risks; for example, in a Hanoi "shooting gallery," a single 200-milliliter common pot of opium solution may provide more than 50 doses for injection in which a single needle and syringe is used for drawing up the solution and injecting.²² In Odessa, ready-filled syringes and frontloading from a dealer's donor syringe are reported as common distribution methods for "himier," a solution prepared from opium straw.³⁹ In a study in Poltava, a Ukrainian city where HIV infection is not already established, 68% of IDUs reported that they usually draw their drug solutions from shared containers.⁴⁰ In Egypt, single injections of "maxiton forte" (an amphetamine-type stimulant) are provided by dealers who draw doses from large bottles, sometimes using a common needle.⁴¹ Anecdotal reports from Belarus, Kazakhstan, Ukraine, and the Russian Federation indicate that human blood may be used as a clarifying agent in the preparation of opium solutions such as "kompot" and "himier."⁴² Outreach education campaigns and risk reduction counseling need to take these issues into consideration, targeting not only IDUs but also others, such as drug dealers, who influence drug use practices.

Agonist pharmacotherapy programs. The provision of noninjecting agonist pharmacotherapy programs can encourage the transition from injecting to noninjecting drug use. Oral methadone is the most widely used and most rigorously evaluated substance for opioid agonist pharmacotherapy. Although well established in certain areas of the United States for more than two decades, it was not until the late 1980s that there was a dramatic expansion of methadone maintenance programs in other regions, such as Australia⁴³ and Europe, with all European Union countries now having such programs.⁴⁴ Evidence of the effectiveness of methadone maintenance programs in preventing HIV infection and reducing risk behaviors has been the rationale for establishing and expanding such programs in many countries. Whereas some countries responded to the HIV epidemic quickly with the introduction of opioid substitution programs when HIV prevalence rates were still low, other countries remained hesitant. For example, despite considerable government reluctance to promote substitution treatment in France, concerns about continuing high HIV prevalence among IDUs played an important role in influencing policy, with the government approving the establishment of methadone and buprenorphine substitution programs in 1994. Methadone was introduced in 1995, with prescription and dispensing limited to special

clinics. Buprenorphine was introduced in early 1996 and was made available through primary health care prescribing and pharmacy dispensing. Rapid expansion of programs ensued, so that by the end of 1996 approximately 4000 heroin users were enrolled in methadone maintenance programs and more than 25,000 were receiving sublingual buprenorphine.

Despite the widespread expansion of agonist pharmacotherapy programs in many developed countries, it has been argued that such treatment approaches are not appropriate, feasible, or affordable for developing countries. Although often restricted to small-scale or pilot projects, a range of such programs has been established in Asia, Latin America, Eastern Europe, and the Newly Independent States. Sublingual buprenorphine maintenance programs have been established in India, including a slum community in New Delhi.¹⁵ Methadone maintenance programs are being implemented in Nepal,⁴⁵ Vietnam, in different regions in Thailand,⁴⁶ and in Latvia, Lithuania, Poland, Slovenia, the Slovak Republic, Hungary, Bulgaria, and the Former Yugoslav Republic of Macedonia. Hong Kong has a well-established and wide-scale, low-threshold methadone maintenance program. A methadone program has been implemented in remote Akha hill-tribe communities in northern Thailand. Tincture of opium is used for detoxification and substitute maintenance in northern Thailand,⁴⁷ while anecdotal reports exist of its informal use in other Mekong countries. Methadone, buprenorphine, and opium tincture for detoxification have been researched in China, where there also is interest in considering maintenance programs.⁴⁸ Despite government reservations about opioid substitution programs in certain countries such as Malaysia and the Russian Federation, the HIV epidemic has put these programs on the agenda for discussion with regard to their possible role in HIV prevention. Methadone detoxification is available in certain circumstances in Tanzania. Buprenorphine and methylmorphine prescription programs have been established to treat heroin users in the Czech Republic.⁴⁹

Many of the Asian agonist pharmacotherapy programs were developed in response to dramatic increases in injecting drug use and associated HIV risk practices. Abstinence-based drug treatment programs did not exist, were unaffordable, or were ineffective in preventing relapse to HIV risk practices. Some of these substitution programs have evolved from within the communities where the drug users live (in response to community-identified needs) and have been designed, implemented, and managed by the communities themselves, often

without government support or formal approval. The characteristics of these programs differ markedly from those in developed countries and, in turn, may help inform the reorientation of institutional substitution programs. Principles of community involvement and integration with primary health care services have made these programs feasible, acceptable, and affordable, even in slum communities and remote tribal villages. A major limiting factor is the high cost of some opioid substitute drugs, which has required external funding assistance from international development agencies or the administration of client fees. With WHO assistance, existing opioid substitution programs are being evaluated in India, Nepal, Thailand, and Vietnam. New pilot studies in these countries and selected other countries in the region will examine the efficacy of a range of substitute drugs, including methadone, buprenorphine, and tincture of opium.⁴⁷

Only limited research has been undertaken on oral psychostimulant agonist pharmacotherapy programs.⁵⁰ Although trials on the use of coca tea and coca leaf tablets for the treatment of cocaine dependence have been conducted in Peru,⁵¹ the efficacy of such treatment has yet to be demonstrated.

In some countries, programs provide injectable agonist drugs to IDUs who are not willing or able, at least in the short term, to stop injecting. The commonly stated aim of such programs is to attract more marginalized and vulnerable IDUs into treatment, including those with significant criminal involvement, health damage, and a history of failing in other treatment programs. Although injectable heroin and methadone have been provided for many years in the United Kingdom, the numbers of individuals in treatment have been small and evaluation has been limited.⁵² The first scientifically evaluated large-scale study of injectable opioid prescribing—including injectable heroin, morphine, and methadone—has recently been completed by the Swiss National Government.⁵³ Another study examining the use of both injectable and smokable heroin was proposed to start in The Netherlands in early 1998. Although research has been undertaken in Australia on the feasibility of implementing clinical trials on injectable heroin,⁵⁴ federal government authorization to proceed has been withheld.

Injectable substitution programs do not exist in developing countries. However, in India, the intramuscular injection of buprenorphine by medical practitioners and drug treatment services in some cities is used to treat individuals withdrawing from heroin. This common practice has inadvertently triggered an epidemic spread of illicit buprenorphine injecting in some communities, an

undesired effect that has implications for the education of medical practitioners and other health care workers in the use of parenteral treatments and the management of IDUs.

Detoxification and maintaining abstinence. The HIV pandemic associated with injecting drug use also has stimulated the expansion of abstinence-based drug treatment programs in many countries. Engaging and retaining IDUs in drug treatment provides opportunities for HIV education, other preventive interventions, and access to primary health care. However, in acknowledging the high rates of relapse across abstinence-based treatment approaches, specific consideration needs to be given to educating clients in HIV risk management and ensuring access to sterile injection equipment if relapse occurs.

Some community-based drug treatment programs, particularly in the Asian region (including India, Sri Lanka, and Thailand) promote "rehabilitation before detoxification." This approach recognizes that health risk reduction and improvement in health status and social functioning are valid intermediate goals, with abstinence as a longer term objective.⁵⁵ During this period of rehabilitation, individuals and family members are stabilized and prepared for detoxification and the maintenance of abstinence, an important component of which is dispelling myths about detoxification. Although anecdotal reports indicate that some of these programs are extremely effective, formal evaluation has yet to be undertaken.

Alternative models of traditional healing are well established in many regions where injecting drug use is common and HIV risk is high. These models often incorporate significant elements of spiritual healing and symbolic ritual within a framework of holistic care and community involvement.⁵⁶ Only limited formal evaluation has been undertaken on their effectiveness and suitability for replication in other settings.

Reducing sexual risk practices. There is increasing awareness that sexual transmission plays an important role in the dynamics of HIV infection among IDUs and their noninjecting sex partners. It is evident that more research is required, particularly in developing countries, to further investigate the different relationships that exist among substance use, sexual behavior, and HIV infection. WHO has initiated a project in collaboration with the Joint United Nations Programme on HIV/AIDS (UNAIDS) to investigate this issue in a range of different populations in developing and transitional countries, including among male prisoners and female sex workers in

Costa Rica, male military recruits and their sex partners in Slovakia, and patrons of beer halls in Zimbabwe.

Outreach, Peer Education, and Social Network Interventions

The specific strategies for influencing behavior change discussed in the previous section will be effective only if they manage to reach and are accepted and adopted by those populations at risk. Outreach strategies aim to deliver information and services to hard-to-reach populations and establish links between IDUs and health services. Various models of outreach exist, including targeting individual IDUs and communities or networks of IDUs. Particularly vulnerable groups include the urban poor; street children;⁵⁷ prisoners;³⁰ sex workers; itinerant and guest workers; remote rural communities; refugees and displaced people from civil conflicts and natural disasters; ethnic minority, tribal, and indigenous groups; individuals with physical and mental disabilities; and communities living in drug-producing areas. Different forms of interventions targeting IDUs have been implemented successfully in these difficult settings, including peer-led HIV prevention education programs, bleach and condom distribution, needle-syringe exchange programs, and opioid substitution programs.

Networks of IDUs provide excellent opportunities for outreach programs to influence peer group and social norms. Peer education programs among drug users have been shown to be effective in reducing both HIV risk behavior and HIV infection rates,⁵⁸ whereas peer-based needle-syringe exchange programs have been shown to be more effective in reaching new clients than programs conducted by nonpeers.⁵⁹ The use of ex-IDUs as peer educators also plays an important role in intervention programs in developing countries such as India^{15,32} and Nepal.³⁷ In some communities, new models of outreach have been developed that aim to involve IDUs more effectively as outreach workers.⁶⁰ In some countries (notably Australia and many European countries), drug users have organized to form drug users' organizations for advocating on behalf of IDUs and for implementing HIV prevention programs (including peer outreach, education, and needle-syringe exchange).⁶¹ Such groups are now emerging in various developing countries such as India.⁶²

The Role of Public Health and Health Promotion

Strategies targeting individual behavior change will be successful only if they are positioned within a public

health context, recognizing the complexities of interpersonal, social, cultural, and environmental interactions. The Ottawa Charter on Health Promotion⁶³ provides a useful framework for designing an integrated public health response to HIV infection associated with injecting drug use, incorporating five areas for action: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services. (A more detailed discussion on this issue is presented elsewhere.¹¹)

Conclusion

Whereas it is recognized that injecting drug use poses a wide range of health risks and requires a broad-based response, there are specific intervention components that have been demonstrated to be effective in preventing HIV infection. Situation assessment will inform how these specific HIV prevention interventions may be adapted and combined to form a comprehensive and integrated strategy. The vigorous and early implementation of such a strategy, while the prevalence of both injecting drug use and HIV infection is low, will be most effective.

This can occur only if there is a supportive policy environment that requires a public health response involving intersectorial cooperation across all areas. Both individual interventions and comprehensive strategies have been demonstrated to be feasible not only in developed countries but also in developing and transitional countries.

The views expressed in this chapter by named authors are solely the responsibility of those authors.

The designations employed and the presentation of the material in this chapter do not imply the expression of any opinion whatsoever on the part of the authors or the organizations with which they are affiliated concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitations of its frontiers or boundaries.

The authors would like to thank a number of individuals for providing information for inclusion in this chapter and reviewing the text for comments: D. Des Jarlais, M.C. Donoghoe, D. Goldberg, C. Goos, L. Khodakevich, P. Millson, R. Needle, A. Reynolds, H. Sell, G. Stimson, and A. Wodak. Appreciation is also given to L. Demolis for assisting with the preparation of the manuscript and figures. Much of the information has been drawn from work undertaken in association with a range of projects being implemented by the World Health Organization Programme on Substance Abuse and the United Nations Joint Programme on HIV/AIDS.

References

- Mann J, Tarantola DJM, Netter TW, editors. *AIDS in the world*. Cambridge (MA): Harvard University Press; 1992.
- Donoghoe MC, Wodak A. Health and social consequences of injecting drug use. In: Stimson GV, Des Jarlais DC, Ball AL, editors. *Drug injecting and HIV infection: global dimensions and local responses*. London: UCL Press. In press 1998.
- Stimson GV, Adekan M, Rhodes T. The diffusion of drug injecting in developing countries. *Int J Drug Policy* 1996;7:245-55.
- World Health Organization. *STD/HIV/AIDS surveillance report: special edition*. Manila (Philippines): WHO Regional Office for the Western Pacific. Issue No. 10; 1997 Oct.
- United Nations Programme on HIV/AIDS. *Report on the global HIV/AIDS epidemic: December 1997*. Geneva (Switzerland): United Nations Programme on HIV/AIDS; 1997.
- Ball A, Des Jarlais D, Donoghoe MC, Friedman SR, Goldberg D, Hunter GM, et al. Multi-city study on drug injecting and risk of HIV infection: a report prepared on behalf of the WHO International Collaborative Group. *WHO/PSA/94.4*, Geneva (Switzerland): World Health Organization; 1994.
- Des Jarlais DC, Hagan H, Friedman SR, Friedmann P, Goldberg D, Frischer M, et al. Maintaining low HIV seroprevalence in populations of injecting drug users. *JAMA* 1995;274:1226-31.
- Peak A, Rana S, Maharjan SH, Jolley D, Crofts N. Declining risk for HIV among injecting drug users in Kathmandu, Nepal: the impact of a harm-reduction programme. *AIDS* 1995;9:1067-70.
- Stimson GV. Has the United Kingdom averted an epidemic of HIV-1 infection among drug injectors? *Addiction* 1996;91:1085-8.
- Khodakevich L. Development of HIV epidemics in Belarus, Moldova and Ukraine. Paper presented at the 8th International Conference on the Reduction of Drug Related Harm; 1997 Mar 23-27; Paris, France.
- Ball AL. Policies and interventions to stem HIV-1 epidemics associated with injecting drug use. In: Stimson GV, Des Jarlais DC, Ball AL, editors. *Drug injecting and HIV infection: global dimensions and local responses*. London: UCL Press. In press 1998.
- National Institute on Drug Abuse (US). Needle RH, Coyle SL, Genser SG, Trotter RT, editors. *Social networks, drug abuse, and HIV transmission*. National Institute on Drug Abuse Research Monograph 151. Washington: Government Printing Office; 1995. NIH Pub. No. 95-3889.
- Power R. A model for qualitative action research amongst illicit drug users. *Addiction Res* 1995;3:165-81.
- Wiebel W. Ethnographic contributions to AIDS intervention strategies. In: Rhodes T, Hartnoll R, editors. *AIDS, drugs and prevention: perspectives on individual and community action*. London: Routledge; 1996.
- Dorabjee J, Samson L, Dyalchand R. A community-based intervention for injecting drug users (IDUs) in New Delhi slums. Paper available at XI International Conference on AIDS; 1996 Jul 7-12; Vancouver, Canada.
- Kanga K. Drug intervention/awareness among IDUs in the slums. Abstract No. Mo.D.242, XI International Conference on AIDS; 1996 Jul 7-12; Vancouver, Canada.
- Kumar MS. A study of buprenorphine abuse in Madras City,

- India. In: Kumar MS, Mudaliar S, Daniels D, editors. Research monograph on drug abuse and HIV/AIDS. Chennai (India): SAHAI Trust; 1997. p. 19-37
18. Panda S, Chatterjee A, Sarkar S, Jalan KN, Maitra T, Mukherjee S, et al. Injection drug use in Calcutta: a potential focus for explosive HIV epidemic. *Drug Alcohol Rev* 1997;16:17-23.
 19. Strang J, Des Jarlais DC, Griffiths P, Gossop M. The study of transitions in the route of drug use: the route from one route to another. *Br J Addict* 1992;87:473-83.
 20. van Ameijden EJ, van den Hoek JAR, Hartgers C, Coutinho RA. Risk factors for the transition from noninjection to injection drug use and accompanying AIDS risk behavior in a cohort of drug users. *Am J Epidemiol* 1994;139:67-77.
 21. Grund JPC, Nolim D. A heroin epidemic in Macedonia. Report to the Open Society Institute, New York, and the Open Society Institute, Macedonia; 1995. Available from: The Lindesmith Center, New York.
 22. Power R. Rapid assessment of the drug injecting situation in Hanoi and Ho Chi Minh City, Vietnam. Report to United Nations International Drug Control Programme; 1994.
 23. Stimson GV. HIV infection and injecting drug use in the Union of Myanmar. Report to the United Nations International Drug Control Programme; 1994 Feb 1.
 24. Ingold FR. Rapid assessment of illicit drug abuse in Greater Beirut. Report to United Nations International Drug Control Programme; 1994.
 25. Wansi E, Sam-Abbenyi A, Befidi Mengue R, Ntone Enyme F, Ntone Ntone F. Rapid assessment of drug abuse in Cameroon. Report to the United Nations International Drug Control Programme.
 26. Tyrlik M, Zuda T, Bem P, Power R. Rapid assessment of the drug use situation in the Czech Republic. Report to the United Nations International Drug Control Programme; 1996.
 27. Burt J, Stimson GV. Drug injectors and HIV risk reduction: strategies for protection. London: Health Education Authority; 1993.
 28. Broadhead RS. Social construction of bleach in combating AIDS among injection drug users. *J Drug Issues* 1991;21:713-37.
 29. Correctional Service of Canada. HIV/AIDS in prisons: final report of The Expert Committee on AIDS and Prisons. Ottawa: Correctional Service of Canada; 1994.
 30. Dolan K, Wodak A, Penny R. AIDS behind bars: preventing HIV spread among incarcerated drug injectors. *AIDS* 1995;9:825-32.
 31. Hangzo C, Chatterjee A, Sarkar S, Zomi GT, Deb BC, Abdul-Quader AS. Reaching out beyond the hills: HIV prevention among injecting drug users in Manipur, India. *Addiction* 1997;92:813-20.
 32. Chatterjee A, Hangzo CZ, Abdul-Quader AS, O'Reilly KR, Zomi GT, Sarkar S. Evidence of effectiveness of street-based peer outreach intervention to change cleaning behavior among injecting drug users in Manipur, India. Abstract No. Th.C.422, XI International Conference on AIDS; 1996 Jul 7-12; Vancouver, Canada.
 33. Ball A. Averting a global epidemic. *Addiction* 1996;91:1095-8.
 34. Stimson GV, Donoghoe MC. Health promotion and facilitation of individual change: the case of syringe distribution and exchange. In: Rhodes T, Hartnoll R, editors. *AIDS, drugs and prevention: perspectives on individual and community action*. London: Routledge; 1996.
 35. Des Jarlais DC, Hagan H, Paone D, Friedman SR. HIV incidence among syringe exchange participants: the international data. Abstract No. Tu.C.322, XI International Conference on AIDS; 1996 Jul 7-12; Vancouver, Canada.
 36. World Health Organization. WHO Drug Injecting Study phase II: report of planning meeting. Geneva (Switzerland): Programme on Substance Abuse, WHO; 1996. Report No. WHO/PSA/96.4.
 37. Maharjan SH, Singh M. Street-based outreach program for injecting drug users. Abstract No. Mo.D.244, XI International Conference on AIDS; 1996 Jul 7-12; Vancouver, Canada.
 38. Gray J. Operating needle exchange programmes in the hills of Thailand. *AIDS Care* 1995;7:489-99.
 39. Rhodes T, Fitch C. WHO/UNAIDS pilot visit: Odessa, Ukraine. Unpublished report to the World Health Organization and United Nations Programme on HIV/AIDS.
 40. Protopopov AA, Zaporozhets OL. Report on the results of behavioral studies among injecting drug users in Poltava; 1997.
 41. World Health Organization. Amphetamine-type stimulants: a report from the WHO Meeting on Amphetamines, MDMA and other Psychostimulants: Geneva, 12-15 November 1996 (pre-publication issue). Geneva (Switzerland): Programme on Substance Abuse, WHO; 1997. Report No. WHO/MSA/PSA/97.5.
 42. Galybin A, Merkoulouva M, Sheveleva L, Dodryakova T. The first Moscow needle exchange program. VII International Conference on the Reduction of Drug Related Harm; 1997 Mar 23-27; Paris, France.
 43. Ward J, Mattick R, Hall W. The effectiveness of methadone maintenance treatment: an overview. *Drug Alcohol Rev* 1994;13:327-36.
 44. Farrell M, Neeleman J, Gossop M, Griffiths P, Buning E, Finch E, et al. Methadone provision in the European Union. *Int J Drug Policy* 1995;6:168-72.
 45. Shresta DM, Shresta NM, Gautam K. Methadone treatment programme in Nepal: a one-year experience. *J Nepalese Med Assoc* 1995;33:33-46.
 46. Vanichseni S, Wongsuwan B, Staff of the BMA Narcotics Clinic No. 6, Choopanya K, Wongpanich K. A controlled trial of methadone maintenance in a population of intravenous drug users in Bangkok: implications for prevention of HIV. *Int J Addict* 1991;26:1313-20.
 47. World Health Organization. WHO Drug Substitution Project: Report of Meeting on Opioid Substitution Programmes in Asia: Kathmandu, Nepal, 10-14 February 1997. Geneva (Switzerland): Programme on Substance Abuse, WHO; 1997. Report No. WHO/M3A/PSA/98.
 48. China Ministry of Health and United Nations Theme Group on HIV/AIDS in China. China responds to AIDS: HIV/AIDS and needs assessment report. Beijing (China): The Ministry and The Group; 1997.
 49. World Health Organization. Report on Consultation Meeting on WHO Drug Substitution Project. Geneva (Switzerland): Programme on Substance Abuse, WHO; 1996. Report No. WHO/PSA/96.3.
 50. Mattick R, Darke S. Drug replacement treatments: is amphetamine substitution a horse of a different colour? *Drug Alcohol Rev* 1995;14:389-94.
 51. Llosa T. The standard low dose of oral cocaine used for treatment of cocaine dependence. *Subst Abuse* 1994;15:215-20.
 52. Strang J, Ruben S, Farrell M, Gossop M. Prescribing heroin and

- other injectable drugs. In: Strang J, Gossop M, editors. Heroin addiction and drug policy: the British system. Oxford (UK): Oxford University Press; 1994. p. 193–206.
53. Uchtenhagen A, Gutzwiller F, Dobler-Mikola A, editors. Programme for a medical prescription of narcotics: final report of the research representatives. Berne (Switzerland): Swiss Federal Office of Public Health; 1997.
54. Bammer G. Report and recommendations of stage 2 feasibility research into the controlled availability of opioids. Canberra (Australia): National Centre for Epidemiology and Population Health, The Australian National University and The Australian Institute of Criminology; 1995 Jun.
55. World Health Organization. Community based approaches to treatment and care of substance dependence: report on a WHO consultation. Geneva (Switzerland): Programme on Substance Abuse, WHO; 1993.
56. Jilek WG. The role of traditional healing in the management of substance abuse. In: World Health Organization. Approaches to treatment of substance abuse. Geneva (Switzerland): Programme on Substance Abuse, WHO; 1993. Pub. No. WHO/PSA/93.10.
57. Ball A, Howard J. Psychoactive substance use among street children. In: Harpham T, Blue I, editors. Urbanization and mental health in developing countries. Aldershot (UK): Avebury; 1995. p. 123–49.
58. Wiebel W, Jimenez A, Johnson W, et al. Positive effect on HIV seroconversion of street outreach interventions with IDU in Chicago, 1988–1992. IX International Conference on AIDS; 1993; Berlin, Germany.
59. Herkt D. Peer-based user groups: the Australian experience. In: Heather N, Wodak A, Nadelmann E, O'Hare P, editors. Psychoactive drugs and harm: from faith to science. London: Wurr Publishers; 1993.
60. Grund JPC, Broadhead RS, Hekathorn DD, Stern LS, Anthony DL. Peer-driven outreach to combat HIV among IDUs: a basic design and preliminary results. In: Rhodes T, Hartnoll R, editors. AIDS, drugs and prevention: perspectives on individual and community action. London: Routledge; 1996.
61. Jose B, Friedman SR, Neaigus A, Curtis R, Sufian M, Stepherson B, et al. Collective organisation of injecting drug users and the struggle against AIDS. In: Rhodes T, Hartnoll R, editors. AIDS, drugs and prevention: perspectives on individual and community action. London: Routledge; 1996.
62. Beyond appearances. Beyond appearances: a monthly newsletter for the benefit of drug users and ex-drug users. New Delhi (India): Sharan Society for Helping the Urban Poor; 1997 Aug–Sep.
63. World Health Organization. Health promotion: Ottawa charter. Geneva (Switzerland): WHO; 1986. Report No. WHO/HPR/HEP/95.1. ■